AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the

application:

LISTING OF CLAIMS:

1-15 (canceled).

16 (new):   An illumination system for a microlithography projection exposure installation for illuminating an illumination field with light of an assigned light source, comprising:

at least one polarization compensator located in or in a vicinity of a pupil plane of the illumination system, the polarization compensator having at least one polarization changer for influencing the polarization state of a light distribution in the pupil plane as a function of location,

wherein the polarization compensator is configured to at least partly compensate polarization changes caused by angularly-dependent polarization-changing optical elements of the illumination system.

17 (new):   The illumination system as claimed in claim 16, wherein the polarization compensator has a polarization-changing function that varies as a function of location and has an even radial symmetry with reference to an optical axis of the polarization compensator.

18 (new):   The illumination system as claimed in claim 17, wherein the polarization-changing function has at least one of a two-fold and a four-fold radial symmetry.

19 (new):   The illumination system as claimed in claim 16, further comprising an integrator rod arrangement with a light entry surface and a light exit surface, where the integrator rod arrangement has a polygonal cross section with rod sides and rod corners.

20 (new):   The illumination system as claimed in claim 19, wherein the integrator rod arrangement has a rectangular cross section.

21 (new):   The illumination system as claimed in claim 19, wherein the polarization compensator has a number, corresponding to the number of the rod corners, of first sectors with a first polarization-changing effect, and of second sectors, corresponding to the number of the rod sides and lying in the circumferential direction of the polarization compensator between the first sectors, with a second polarization-changing effect, the first sectors lying in angular sections assigned to the rod corners, and the second sectors lying in angular sections assigned to the rod sides, and the first and second polarization-changing effects being different.

22 (new):   The illumination system as claimed in claim 19, wherein the illumination system has a device for generating a quadruple-shaped light distribution in a pupil plane, wherein the light distribution is set such that regions of high light intensity of the quadruple-shaped light distribution are localized in angular sections in which the rod corners are localized.

23 (new):   The illumination system as claimed in claim 16, further comprising:

one of a diffractive and a refractive optical raster element with a two-dimensional raster structure located in or in a vicinity of a pupil plane of the illumination system;

where the polarization compensator is positioned in or in the vicinity of the pupil plane.

24 (new):   The illumination system as claimed in claim 23, wherein the optical raster element is positioned in a light path upstream of a light entry surface of an integrator rod arrangement.

25 (new):   The illumination system as claimed in claim 16, further comprising:

an imaging objective configured to image a field plane of the illumination system onto the illumination field;

wherein the polarization compensator is located in or in a vicinity of a pupil plane of the imaging objective.

26 (new):   The illumination system as claimed in claim 25, wherein the imaging objective is configured to image a light exit plane of an integrator rod arrangement onto the illumination field.

27 (new):   The illumination system as claimed in claim 16, wherein the polarization compensator has a polarization changer configured as a raster element with a two-dimensional arrangement of elements, wherein at least one of:

- the elements are made from birefringent material of different thickness,

- the elements are made from birefringent material having different crystal orientation, and

- the elements have different birefringent structures.

28 (new):   The illumination system as claimed in claim 16, wherein the polarization changer of the polarization compensator is a plate having a height profile and made from a birefringent material of varying thickness.

29 (new):   A method for producing a polarization compensator configured to be introduced into an illumination system, the method comprising:

determining an angularly dependent variation in polarization within the illumination
system that is caused by at least one angularly-dependent polarization-changing optical
element;

calculating a polarization change that varies as a function of location in a pupil plane
in order to compensate the angularly-dependent polarization change;

producing the polarization compensator such that the location-dependent polarization
change is suitable for at least partial compensation of the angularly-dependent polarization
change; and

locating the polarization compensator in or in a vicinity of a pupil plane of the
illumination system such that the desired compensation effect occurs.

30 (new):   The method as claimed in claim 29, wherein the polarization
compensator is produced as a raster element with a two-dimensional arrangement of elements
made from birefringent material where at least one of a thickness and a crystal orientation of
the birefringent material of the elements is prescribed as a function of location or where the
elements are elements with different birefringent structures prescribed as the function of
location such that the location-dependent polarization change compensates at least partly the
angularly-dependent polarization change.

31 (new):   The method as claimed in claim 29, wherein the illumination system
has an integrator rod arrangement with a light entry surface and a light exit surface, and the
integrator rod arrangement has a polygonal cross section with rod sides and rod corners, and
wherein the polarization compensator has a number, corresponding to the number of the rod
corners, of first sectors with a first polarization-changing effect, and of second sectors,
corresponding to the number of the rod sides and lying in the circumferential direction of the
polarization compensator between the first sectors, with a second polarization-changing
effect, the first sectors lying in angular sections assigned to the rod corners, and the second
sectors lying in angular sections assigned to the rod sides, and the first and second
polarization-changing effects being different.

32 (new): The method as claimed in claim 30, wherein in order to calculate the location-dependent polarization change, averaging is carried out over all the points of a field plane that is related by Fourier transformation to the pupil plane that is provided for locating the polarization compensator.

33 (new): A microlithography projection exposure installation having an illumination system and a projection objective, wherein the illumination system is designed as claimed in claim 16.

34 (new): The microlithography projection exposure installation as claimed in claim 33, wherein the projection objective comprises a physical beam splitter with a polarization-selective beam splitter surface.

35 (new): An illumination system for a microlithography projection exposure installation for illuminating an illumination field with light of an assigned light source, comprising

at least one polarization compensator having at least one polarization changer for influencing the polarization state of a light distribution in a pupil plane of the illumination system as a function of location;

wherein the polarization compensator is configured to at least partly compensate polarization changes caused by angularly-dependent polarization-changing optical elements of the illumination system;

wherein the polarization compensator has a polarization-changing function that varies as a function of location and has an even radial symmetry with reference to an optical axis of the polarization compensator.

36 (new):   The illumination system as claimed in claim 35, wherein the polarization-changing function has at least one of a two-fold and a four-fold radial symmetry.

37 (new):   The illumination system as claimed in claim 35, further comprising an integrator rod arrangement with a light entry surface and a light exit surface, where the integrator rod arrangement has a polygonal cross section with rod sides and rod corners.

38 (new):   The illumination system as claimed in claim 37, wherein the polarization compensator has a number, corresponding to the number of the rod corners, of first sectors with a first polarization-changing effect, and of second sectors, corresponding to the number of the rod sides and lying in the circumferential direction of the polarization compensator between the first sectors, with a second polarization-changing effect, the first sectors lying in angular sections assigned to the rod corners, and the second sectors lying in angular sections assigned to the rod sides, and the first and second polarization-changing effects being different.

39 (new):   The illumination system as claimed in claim 37, wherein the illumination system has a device for generating a quadruple-shaped light distribution in a pupil plane;

wherein the integrator rod arrangement has a rectangular cross section; and wherein the light distribution is set such that regions of high light intensity of the quadruple-shaped light distribution are localized in angular sections in which the rod corners are localized.

40 (new):   The illumination system as claimed in claim 35, further comprising:

one of a diffractive and a refractive optical raster element with a two-dimensional raster structure located in or in a vicinity of a pupil plane of the illumination system;

where the polarization compensator is positioned in or in the vicinity of the pupil plane.

41 (new):   The illumination system as claimed in claim 40, wherein the optical raster element is positioned in a light path upstream of a light entry surface of an integrator rod arrangement.

42 (new):   The illumination system as claimed in claim 35, further comprising:

an imaging objective configured to image a field plane of the illumination system onto the illumination field;

wherein the polarization compensator is located in or in a vicinity of a pupil plane of the imaging objective.

43 (new):   The illumination system as claimed in claim 35, wherein the polarization compensator has a polarization changer configured as a raster element with a two-dimensional arrangement of elements, wherein at least one of:

- the elements are made from birefringent material of different thickness,

- the elements are made from birefringent material having different crystal orientation, and

- the elements have different birefringent structures.

44 (new):   The illumination system as claimed in claim 35, wherein the polarization changer of the polarization compensator is a plate having a height profile and made from a birefringent material of varying thickness.